



## Microsoft Windows XP Embedded Customer Solution Case Study



### Taito Cuts Game Development Time and Costs Significantly with PC-Based Game Board

#### Overview

**Country or Region:** Japan

**Industry:** Media and entertainment

#### Customer Profile

Taito Corporation, which employs 1132 employees, is a leading Japanese amusement company. It operates game arcades, develops and markets arcade game machines and game console software. It also provides content for mobile phones and online shopping.

#### Business Situation

To revitalize the sluggish game market in Japan, Taito wanted to develop an industry-standard arcade board to enable anyone to develop a game.

#### Solution

Taito chose Windows® XP Embedded as the operating system for the TAITO Type X arcade board, reducing game development time, improving graphics capability, and providing a reliable game development environment.

#### Benefits

- Needs no costly exclusive hardware.
- Supports wide range of CPU, memory, and video cards.
- Eliminates the need for UPS power.
- Provides excellent reliability and support.
- Cuts development time and costs.

“Our challenge was to develop a new arcade board that allows anyone with a personal computer to produce arcade game software. This is why we were the first in the Japanese arcade game industry to choose the Windows XP Embedded operating system.”

*Takashi Naito, Senior General Manager, AM Business Division*

Taito Corporation, a leading amusement company in Japan, created the Space Invaders Game in 1978 and turned arcade games into a huge international business. However, by September 2003, with a sluggish game market, Taito decided on a new strategy to develop an innovative arcade board that could become an industry standard. The company executives believed that such a board would revitalize the game market and open the door to new game development. Focusing on that goal, in June 2004, the company announced its first new arcade board named TAITO Type X, which runs on the Windows® XP Embedded operating system. Unlike other existing arcade boards, this new board allowed developers—whether individuals or organizations—to create a new game using only a personal computer and widely used game development tools. As a result, development time and costs have been cut significantly.

## Situation

Taito Corporation, a Japanese amusement company known for its highly popular game Space Invaders, develops and markets arcade game machines and game consoles, among its other pursuits. But by 1997, the Japanese game market had reached a peak.

According to a 2004 survey published by the Japan Amusement Machinery Manufacturers Association, in 1999, the sales of arcade game machines totaled 187 billion yen (U.S. \$1.65 billion), but sales had dropped sharply to 140 billion yen (U.S.\$1.24 billion) in 2001. Like other game companies, Taito was concerned about this trend.

One of the major factors for the decline in the market was the high cost of game development. The majority of arcade boards are made by major game manufacturers, which build the boards for their own architecture. Because of this approach, developers had to prepare expensive and specialized facilities and employ full-time engineers to create new games.

As a result, game development costs were skyrocketing. In addition, the reality of the business was that only heavily marketed or well-known games were commercially successful. This challenge made game developers reluctant to invest the time and money required to develop a new game, and consequently only major companies were surviving in the arcade game market.

### **Arcade Board with Easy Access to Development**

To revitalize the arcade game market, Taito Corporation believed it was essential to create an environment that enabled anyone—whether individuals or organizations—to create a new game. Takashi Naito, Senior General Manager, AM Business Division, Taito Corporation, says: “We wanted to develop a new arcade board that could become the de facto standard. We believed this strategy would make us the number one player in the industry. Our challenge was to develop a board that allowed anyone with a personal computer to produce arcade game software.”

## Solution

Along with others in the industry, Taito anticipated the trend away from proprietary hardware in arcade game development toward systems enabling the creation of games on PCs. Taito had been closely tracking the Windows® XP Embedded operating system (OS) and its associated hardware and development tools to make certain the OS would work on its board.

“In 2003, we saw there had been improvements in the performance of consumer video cards and decided to go ahead in developing a new arcade board on a Windows platform,” says Naito. “The Taito AM Business Division manufactures and markets arcade game machines for both internal and external customers. However, until 2003, we did not manufacture arcade boards, even though they are the heart of the game machine. Instead we purchased them from other companies. This situation was beneficial to us because we could plan the board development with no production restriction. In addition, Unidux, our development

partner, actively helped us by providing the latest information about Windows.”

### **Industry Standard Board with World Standard Software**

The AM Business Division recognized that the Windows XP Embedded is a worldwide standard OS and chose it for its reliability and usability. The leaders of the division also appreciated the fact that Windows XP Embedded was similar to Microsoft® Windows, a leading game development environment. The similarities between the two operating systems would help with development, which was another factor.

The extensive support in Windows XP Embedded for a range of hardware components was another key criterion for Taito, because it enabled the company to offer a choice of configurations to customers. Among other options, customers can use the board with Intel Celeron or Pentium 4 processors with between 256MB and 2GB of memory, as well as the complete ATI Radeon range of video cards.

It took the company only one year to plan, develop, and mass produce the board, and the company announced its release in June 2004.

### **Benefits**

Many game developers have shown interest in the development of TAITO Type X. “It has been two years since our launch, and we still enjoy an excellent reputation for the quality and reliability of our product,” says Naito. “Sales have reached 30,000 units, exceeding our original target of 20,000. There is an increase in the number

of game software companies who have decided to adopt TAITO Type X. Therefore, sales are expected to continue growing smoothly.”

The TAITO Type X board, based on Windows XP Embedded, delivers several advantages:

### **Requires No Initial Investment in Exclusive Hardware**

Unlike traditional game boards, the TAITO Type X board requires no initial investment in exclusive hardware and facilities. Windows XP Embedded also offers an excellent range of game development tools, including the Microsoft DirectX® 9.0c application programming interface. The tools are designed to make game development more efficient, allowing game developers to cut their development costs.

### **Offers a Wide Range of Hardware Choices**

Due to the high degree of expandability of the board, the most appropriate hardware, such as the central processing unit (CPU), memory, and video cards, can be chosen according to the required game performance

### **Needs No Uninterruptible Power Supply**

Among the benefits provided by the OS, the TAITO Type X board does not need an uninterruptible power supply (UPS) when there is a loss of power because of the Enhanced Write Filter (EWF) in Windows XP Embedded.

### **Provides Excellent Reliability and Support**

“Our competitors have since reduced their prices. However, our customers still choose TAITO because they value our comprehensive services and the reliability and support of Windows XP Embedded.”

Takashi Naito, Senior General Manager,  
AM Business Division

Many existing boards require specialized engineers to develop them, but the TAITO Type X board does not, because of the reliability and hardware support that Windows operating systems provide.

“When we launched the board, we were able to offer about a 10 to 15 percent cost savings compared to other boards. Our competitors have since reduced their prices and now sell their boards at more or less the same price. However, our customers still choose TAITO Type X because they value our comprehensive services and the reliability and support of Windows XP Embedded. This is proven by the increase in the number of sales for our own game machines and through original equipment manufacturers (OEMs),” says Naito.

#### **Cuts Both Time and Costs Significantly**

Windows XP Embedded offers a substantial game development environment with a wide range of easy-to-use tools. This contributes to a huge reduction in game development time. Takafumi Fujimoto is Team Director, Software Team, VG Group, AM Development Department, AM Business Division, and his testimony is based on his own experience: “When I used existing boards, it took me six months to create a core library because the tools were not all available. However, with the TAITO Type X, it took only two months for me to complete the library. In addition, the ability to debug remotely made our process very efficient.”

As an essential game library for game application development, Microsoft offers DirectX 9.0c free of charge. Furthermore,

because Microsoft Visual Studio® is available as an integrated development environment at a low cost—or even free for the Visual Studio Express edition—even individual developers can quickly develop a game.

In terms of tools, using a traditional arcade board as a development unit would cost about 1 million yen (U.S.\$8,850). For example, a fighting game usually needs around 30 development units, which would cost more than 30 million yen (U.S. \$265,500). This is a very expensive initial investment, a risk which developers take on. With TAITO Type X, however, they can save the initial investment costs because they can develop a game using personal computers.

#### **Delivers Cost Savings for Arcade Operators**

Because Windows XP Embedded with EWF offers great reliability in the event of a sudden power supply cut, arcade operators can eliminate the costs of purchasing a UPS.

An amusement center may have many game machines. When amusement center operators close the business at the end of the day and switch off the electricity supply, they typically do not shut down an individual machine; instead, they shut down the main power supply—for example, by turning off the breaker. To protect the game software from this kind of sudden power cut, arcade operators typically need to provide a UPS for each machine to program a proper shutdown. The UPS typically has a life span of only 6 to 12 months. Eliminating the need for a UPS is a huge cost saving for arcade operators.

**Microsoft®**

### **Makes It Easy to Port Software between Platforms**

TAITO Type X makes it easy to port arcade and PC game applications to any popular games console. Taito has developed original middleware named MTS. This enables developers to port software without changing the source code from an arcade game to PlayStation2, Microsoft Xbox, or Nintendo GameCube, to share game portfolios between different platforms.

### **Expands into Different Industries**

The Taito AM Business Division supplies TAITO Type X to original equipment manufacturers (OEMS), which currently accounts for 55 percent of its business. Major game makers have started using the board. Apart from arcade games, TAITO Type X has been used in a wide range of game types. "Currently, games for children that combine trading cards and game software for consoles are a growth area," says Naito. "It is very pleasing that most card games are developed using TAITO Type X."

TAITO Type X is also being considered for use in industries apart from arcade games —such as pachinko, a Japanese quasi-gambling game that is a cross between a pinball machine and a video slot machine.

"The Japanese pachinko market is very attractive, because it is said to be a 30,000 billion yen (U.S.\$265 billion) industry. We see huge potential in this market. Once 3-D characters with high resolution pictures are required in pachinko machines, there is a good possibility that TAITO Type X will be used as the board. In addition, there is also

a demand from retailers to use the board for their promotional video players."

### **Building on Future Windows Developments**

The continuing development of Windows operating systems, including Windows XP Embedded, is key to the future success of TAITO Type X. "To set up our future strategy and become the de facto standard, it is critical for us to keep up to date with the latest developments and roadmap for Windows and create the next generation of our TAITO Type X arcade boards," says Naito. "We must keep evolving, or we'll lose our leading position, but we are helped in this by the rise of more and more game developers who are experienced in game development in a Windows environment."

## For More Information

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For more information about Taito Corporation products and services, visit the Web site at:  
[www.taito.co.jp](http://www.taito.co.jp)

## Microsoft Windows XP Embedded

For more information about Windows XP Embedded, go to:  
[msdn.microsoft.com/embedded/](http://msdn.microsoft.com/embedded/)

### Software and Services

- Windows
  - Windows XP Embedded
- Visual Studio

### Technologies

- Microsoft DirectX 9.0c

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